



## Procedures and Guidelines

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**APPROVED BY Signature:** Original signed by  
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**TITLE:** Director, OSSMA

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**Responsible Office:** 303/Assurance Management Office  
**Title:** MISSION ASSURANCE GUIDELINES (MAG) IMPLEMENTATION

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### Preface

#### P.1 PURPOSE

This procedure describes the Office of Systems Safety and Mission Assurance (OSSMA) guidelines for developing a Systems Safety and Mission Assurance Program (SSMAP) for GSFC flight products/systems and ground support systems.

#### P.2 APPLICABILITY

This procedure applies to all OSSMA personnel who support Product Design Lead(s) (PDL) in the development of the SSMAP.

#### P.3 AUTHORITY

GPG 7120.2, Project Management

#### P.4 REFERENCES

- a. GPG 1310.1, Customer Commitments and Review
- b. GPG 7120.2, Project Management
- c. GPG 7120.4, Risk Management
- d. GPG 8700.1, Design Planning & Interface Management
- e. GPG 8700.2, Design Development
- f. GPG 8700.3, Design Validation
- g. GPG 8700.4, Integrated Independent Reviews
- h. NASA-STD-8729.1, Planning, Developing, and Managing an Effective Reliability and Maintainability (R&M) Program
- i. NPD 8700.1, NASA policy for Safety and Mission Assurance
- j. NPD 8720.1, NASA Reliability and Maintainability (R&M) Program Policy
- k. NPG 7120.5B, NASA Program and Project Management Processes and Requirements
- l. NPG 8000.4, Risk Management Procedures and Guidelines

CHECK THE GSFC DIRECTIVES MANAGEMENT SYSTEM AT  
<http://gdms.gsfc.nasa.gov/gdms> TO VERIFY THAT THIS IS THE CORRECT VERSION PRIOR TO USE.

m. NPG 8715.3, NASA Safety Manual

n. 300-PG-7120.2.2C, Mission Assurance Guidelines (MAG) for Tailoring to the Needs of GSFC Projects

## **P5. CANCELLATION**

300-PG-8730.4.1, Mission Assurance Guidelines (MAG) Implementation

## **P.6 SAFETY**

Not applicable

## **P.7 TRAINING**

Not applicable

## **P.8 RECORDS**

None

## **P.9 METRICS**

None

## **P.10 DEFINITIONS**

- a. Flight System – Hardware and/or software including spares to be used operationally in space.
- b. Ground Support System – Non-flight hardware and/or software developed for the specific purpose of supporting the procurement, development, test, inspection, validation, verification, operation, and transportation of flight systems and ground systems that directly interact with flight product/system elements.
- c. Product Design Lead (PDL) - The manager or leader with overall responsibility for managing the design activity, managing the technical and organizational interfaces identified during design planning, and where required, forming and leading the Product Design Team (PDT). The term refers to flight project managers, principal investigators, software managers, mission managers, instrument managers, subsystem technical managers, ground system development managers, integrated product development team leaders, lead engineers, etc.
- d. Systems Assurance Manager (SAM) – Code 300 personnel responsible for supporting the PDL in the coordination of the definition and implementation of a Project SSMAP.

## **PROCEDURES**

- 1. The OSSMA shall provide a SAM who is matrixed or co-located to a PDL. The SAM shall administratively report to the Assurance Management Office, Code 303.

2. A SAM shall be assigned to a PDT which is established by a PDL (see GPG 8700.2) based on requirements identified in a Statement of Work that was approved by the PDL and submitted during the program operating plan process (see GPG 1310.1).

3. The SAM shall support the PDT(s) in coordinating the establishment of a SSMAF that is tailored to the specific mission requirements. As part of this process, the SAM shall obtain, analyze and take into consideration any existing NASA supplier survey assessment results as documented and available in the Supplier Assessment System (SAS). In addition, the SAM shall use as a guide the Mission Assurance Guidelines 300-PG-7120.2.2, and, in consultation with functional disciplines in Codes 301 and 302 and applicable expertise available in other GSFC organizations, shall formulate a SSMAF which includes the following elements:

- a) A Quality Management System that is compliant with the minimum requirements of American National Standards Institute (ANSI)/ISO/American Society for Quality (ASQ) Q9001 or equivalent.
- b) A System Safety Program (see NPD 8700.1, NASA Policy for Safety and Mission Assurance, and NPG 8715.3, NASA Safety Manual) that is consistent with the requirements imposed by the appropriated launch range, and the launch vehicle manufacturer or launch services provider.
- c) A Reliability and Maintainability Program (see NPD 8720.1, NASA Reliability and Maintainability (R&M) Program Policy, and NASA-STD-8729.1, Planning, Developing, and Managing an Effective Reliability and Maintainability (R&M) Program) that is designed to effectively interface with other program disciplines, including systems engineering, hardware design, and product assurance.
- d) A Software Assurance Program that includes requirements for Software Quality Assurance, Software Safety, Software Reliability, Verification and Validation, and Independent Verification and Validation that is commensurate with the software size, complexity, criticality, and level of risk.
- e) A Ground Data System Assurance Program (GDS) that is consistent with program requirements.
- f) A Risk Management Program (see NPG 7120.5B, NASA Program and Project Management Processes and Requirements, NPG 8000.4 Risk Management Procedures and Guidelines, and GPG 7120.4, Risk Management) that is consistent with program requirements.
- g) A Technical Review Program (see GPG 8700.4) that is appropriate for the project.
- h) A Design Verification Program (see GPG 8700.3) that includes environmental testing tailored to reflect hardware criticality, mission objectives, hardware characteristics (e.g., physical size or complexity), and the level of risk accepted by the project.
- i) Workmanship Standards (see GPG 8700.1) that assure that all electronic packaging technologies, processes and workmanship activities, selected and applied, meet mission objectives for quality and reliability.
- j) A Parts, Materials and Processes (PMP) Program (see GPG 8700.1) that assures that all parts, materials and processes selected for use in flight hardware meet mission objectives for quality and reliability.

- k) A Contamination Control Program (see GPG 8700.2) that assures the establishment of specific cleanliness requirements and approaches to be followed to control contamination.
- l) An Electrostatic Discharge (ESD) Control Program that assures that all manufacturing, inspection, testing, and other processes will not compromise mission objectives for quality and reliability due to an ESD event.
- m) A Government-Industry Data Exchange Program (GIDEP) participation plan that detects and reports problems that affect or potentially affect the suitability of electronic parts and materials for use in GSFC products or that affect or potentially affect personnel or system safety.

### CHANGE HISTORY LOG

Revision	Effective Date	Description of Changes
Baseline	4/6/99	Newly numbered PG generated reflecting cancellation of GPG 8730.4. References to 8730.4 replaced by references to GPG 7120.2. Format updated to that required by GPG 1410.1. All minor format changes to former 300-PG- 8730.4.1.
A	11/7/01	Section 7.3.1 thru. 7.3.13 modified to ensure completeness and consistency with revised MAG.  P2.f reference updated.
B	4/14/2003	Section 3d updated to reflect the revised Software Assurance section of the MAG (300-PG-7120.2.C). Section 3b, c, f, updated to reflect correct higher-level documents. P.4 REFERENCES updated to reflect additional documentation.